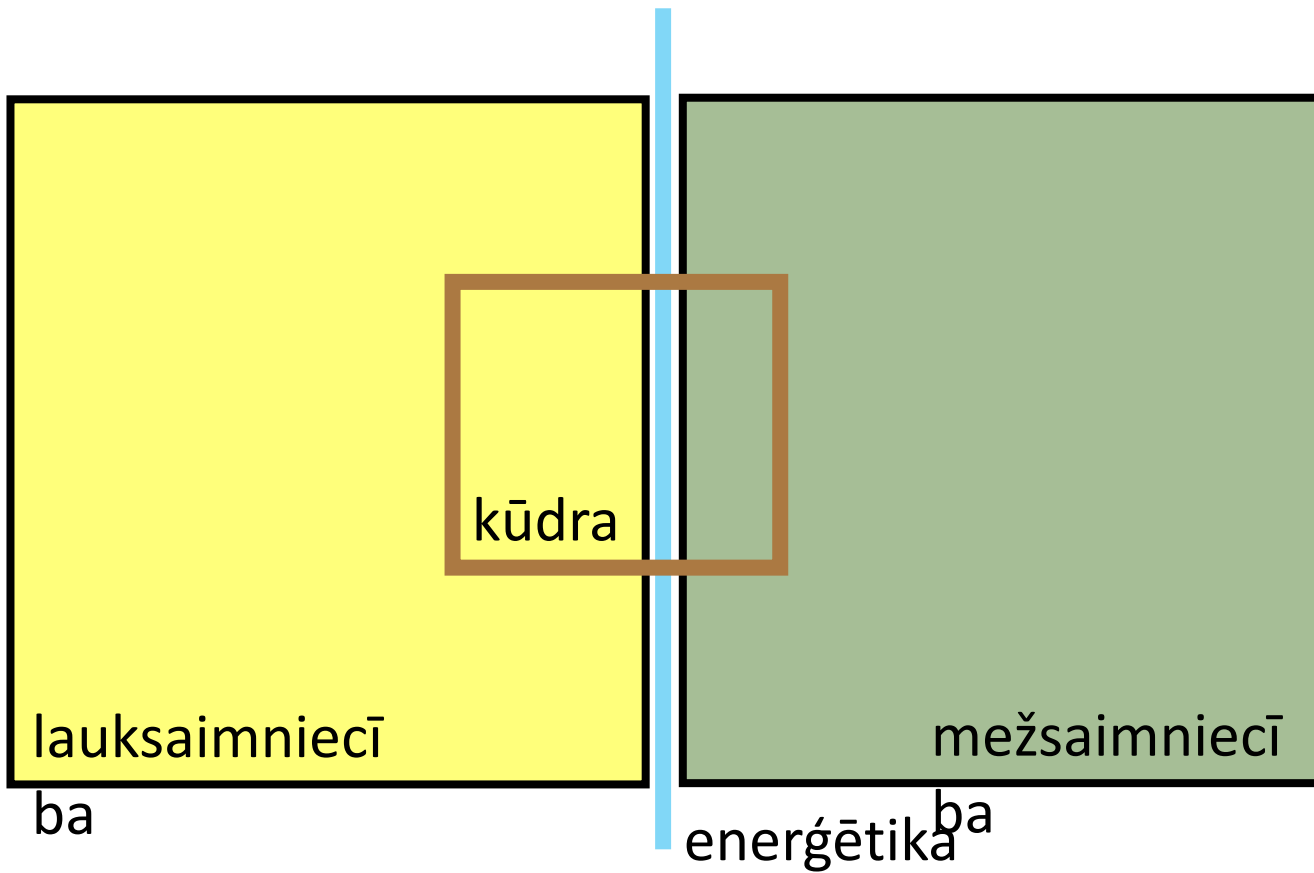


Virzība uz klimatneitralitāti.  
Kūdras nozares izaicinājumi un ilgtspējīgi  
risinājumi.  
Pieredze Ziemeļvalstīs un Latvijā

**Dr.geol.Ilze Ozola**

Ezeru un purvu izpētes centrs  
Latvijas Nacionālā kūdras biedrība  
LVMI “Silava”



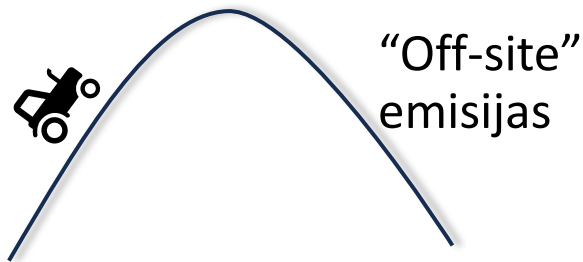
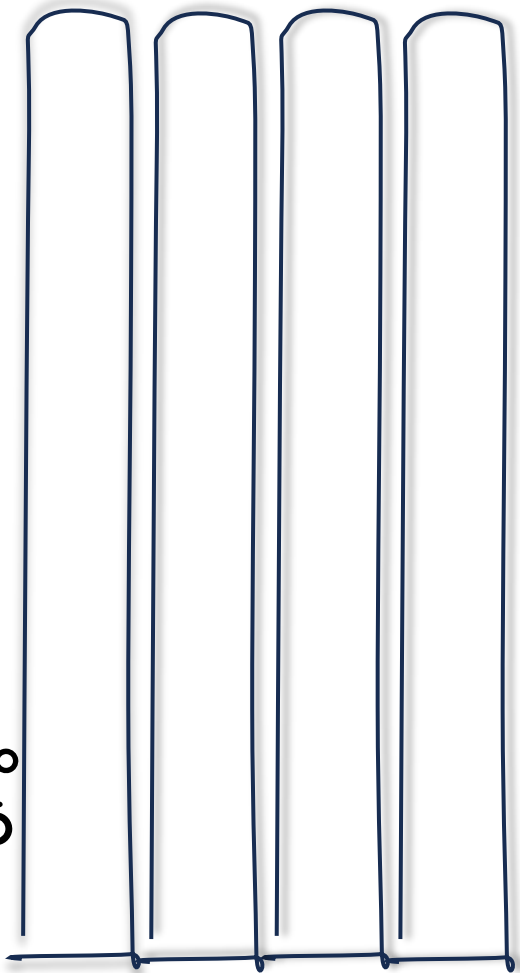
Vai kūdras nozare var  
sasniegt  
klimatneitralitāti?

Vai klimatneitralitāti  
var sasniegt bez  
kūdras?

## “On-site” emisijas

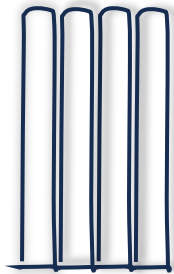
31 620 ha x  
1.21 t CO<sub>2</sub> ha/g\*  
=38 260 t CO<sub>2</sub> ha/g

\*IPCC Tier-2  
emisiju faktors

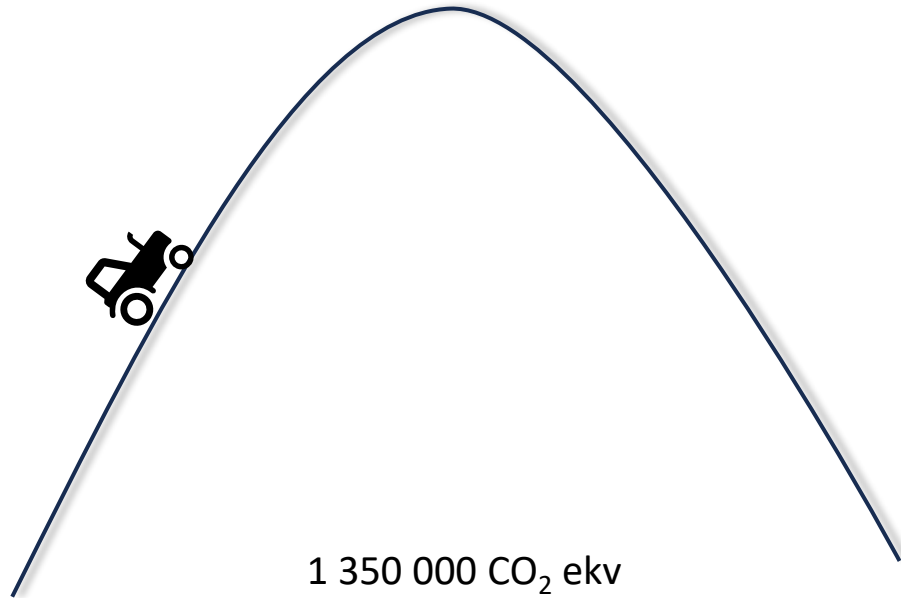


## “Off-site” emisijas

1,3 milj.t CO<sub>2</sub> ekv  
2021.g.



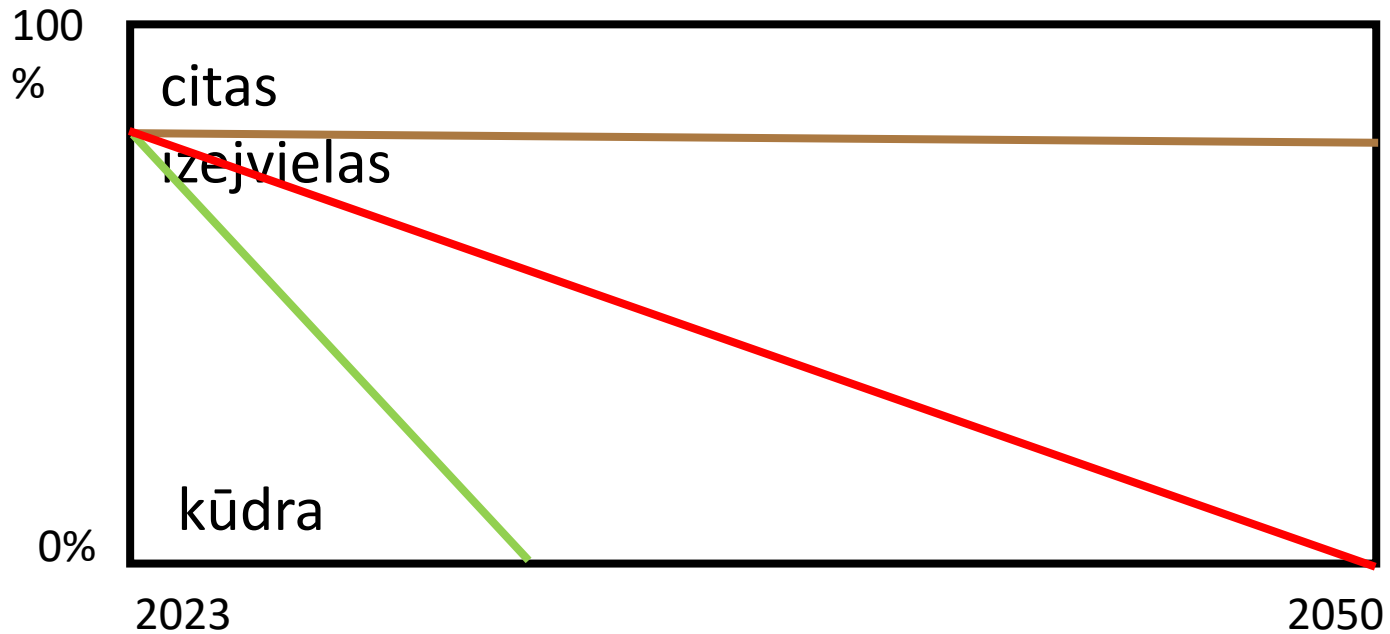
38 260 t CO<sub>2</sub>  
ha/g



1 350 000 CO<sub>2</sub> ekv  
2021.g.

# Kā tad sasniegt klimatneitritāti?

1. Variants - atteikties no kūdras!



100%

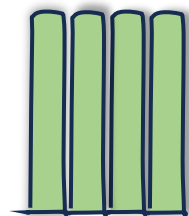


kūdra

citas izejvielas

2050

27  
gadi



25 000 ha biomasas  
audzēšanai kūdras  
aizstāšanai



izpētīt jaunās izejvielas  
– īpašības, ietekme uz  
vidi



pielāgot tehniku  
ražotājiem, audzētājiem



sūnām 800 milj.€, pirmā  
ražā pēc 9 gadiem.



apmācīt jaunus  
speciālistus rekultivācijā  
– vismaz 50 (šobrīd 3  
ģeoloģijas maģistri  
gadā)



pielāgoties jaunajiem  
substrātiem



## Paludiculture in Latvia—Existing Knowledge and Challenges

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**Abstract:** Global climate change impact has increased in recent decades and put urgency on implementing effective climate change mitigation (CCM) activities. Rewetting of drained peatlands is an acknowledged measure to reduce GHG emissions from organic soils in the agriculture and land use sectors. Under waterlogged conditions, decomposition of organic matter in peat decreases, and emissions of CO<sub>2</sub> are reduced. Thus, the soil carbon stock is saved, and wet management of the site reactivates carbon sequestration. To reach CCM targets, the first rewetting and paludiculture trials have been implemented in Latvia. In this article, we review the current status of paludiculture in Latvia and evaluate the pros and cons of their wider implementation. The majority of paludiculture projects and pilot studies in Latvia have not been published so far and are reported here for the first time. Our assessment of paludiculture shows that trials on *Alnus*, *Phalaris*, *Phragmites*, *Sphagnum*, and *Typha* installed by the private enterprises have promising results for upcoming large-scale implementation. There are available areas for paludiculture in Latvia, but the current legislation and national framework policies (environment, agriculture, forest, and climate) do not fully support such activities yet and must be adapted.

**Keywords:** organic soils; peatland; peat; carbon credits; agriculture; forestry

### 1. Introduction

Following the Paris Agreement, climate neutrality must be achieved by 2050. There are multiple approaches to accomplish this, and a significant recommendation from CAP (Common Agricultural Policy) is to rewet organic soils and peatlands. This involves reducing the harvesting of peat and minimizing the usage of drained peatlands for agricultural and forestry purposes. Additionally, it is crucial to explore opportunities to utilize cutover peat areas and unproductive organic soils, which are not suitable for conventional agriculture and/or forestry, in order to achieve climate and biodiversity objectives [1]. Rewetting of organic soils and peatland areas to ensure climate and economically friendly usage is thought to be paludiculture.

Paludiculture is agriculture and forestry on wet and rewetted organic soils and peatlands [2]. Agroecological principles and practices, ecosystem-based management, and other approaches that work with natural processes support food security, nutrition, health and well-being, livelihoods and biodiversity, sustainability, and ecosystem services. These services include not only buffering of temperature extremes but also carbon sequestration and long-term storage, which enhances the resilience of carbon stocks and sinks [3].

Latvia is located in north-eastern Europe, within the hemiboreal zone where precipitation exceeds evaporation, thus allowing for peat formation and accumulation. Peatland comprises nearly 10–12% of the territory of Latvia [4]. Holocene peatland formation in

## Installation and planting costs for *Sphagnum* fields in Rāķa Bog and Ķemeru Bog (LIFE Restore project).

	Rāķa Bog 0.7 ha + 0.3 ha Water Basin	Ķemeru Bog 0.45 ha
Position	Costs, EUR	Costs, EUR
Planning		
Topography	550	-
Project	1658	4666
Site preparation		
Marking the boundaries of the road and the planting area	-	223
Removing overgrowth	-	551
Pumping water out of a cart ditch	-	150
Digging strains and cleaning from mineral soil	8116	-
Leveling	2197	4112
Smoothing and poldering	3937	-
Shaping and compacting causeways	1642	-
Creating a pile from displaced peat	-	1543
Irrigation ditches along the causeways	220	-
Irrigation ditches in the field	1083	-
Water outlet	172	-
Water management		
Water level regulation (monk)	2795	-
Mobile pump (as required)	116	-
Water pool	9790	-
Construction of an overflow and depressions (for sediment capture)	-	1530
Planting		
Collecting moss in the donor area, transport to the field, loading/off-loading	3744	3724
Spreading (manually) of moss material	1380	2270 kg
Straw purchase and transport to the site	-	246
Materials (footbridges, fencing, etc.)	2781	(453 kg)
Total	<b>40 182</b>	<b>19 201</b>



Citation: Ozola, I.; Dauskane, I.; Aunina, I.; Stivrins, N. Paludiculture in Latvia—Existing Knowledge and Challenges. *Land* **2023**, *12*, 2039. <https://doi.org/10.3390/land12112039>

Received: 24 July 2023

Revised: 17 October 2023

Accepted: 19 October 2023

Published: 9 November 2023



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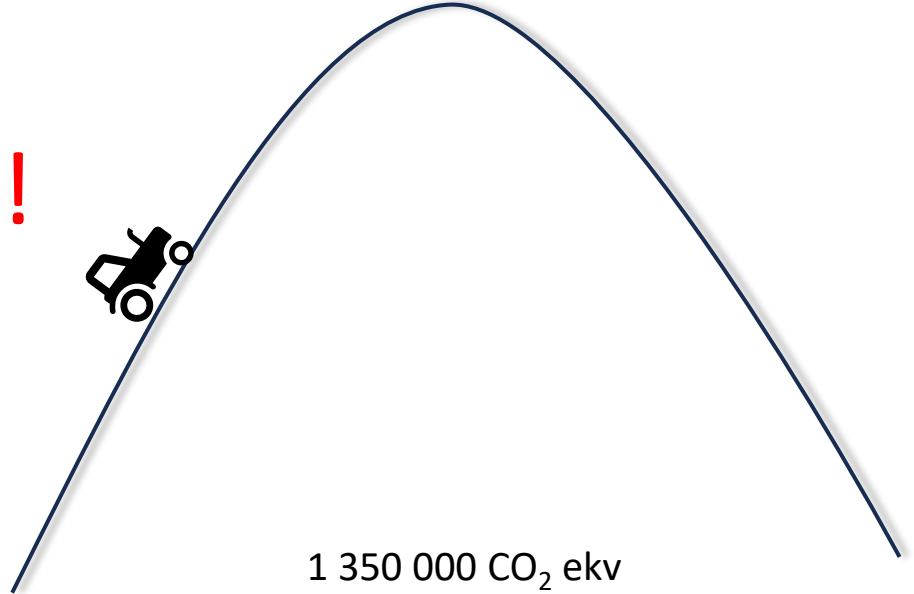
	CO <sub>2</sub>	CH <sub>4</sub>	Net CO <sub>2</sub> eq	CO <sub>2</sub> eq 25 000 ha
<b>Sphagnum moss</b>	Capture 6.29 t/ha	Emit 0.014 t/ha	5.94	148 500
<b>Alnus glutinosa</b>	Capture 3.5 t/ha	Emit 0.067 t/ha	1.825	45 000
<b>Reed canary grass Phalaris</b>	Capture 3.8 t/ha	Emit 0.01 t/ha	3.55	88 750
<b>Phragmites australis</b>	Capture 8.94 t/ha	Emit 0.3 t/ha	1.44	36 000

Kā sasniegt  
klimatneitrlitāti?

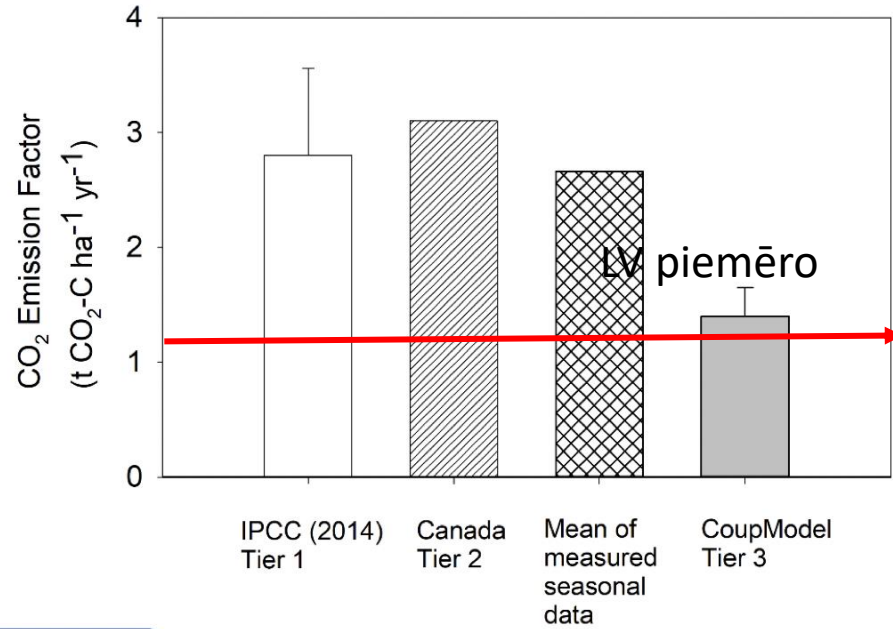
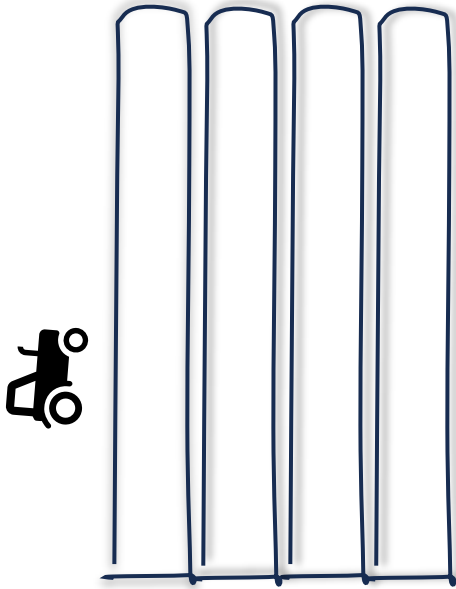
2.variants **DATI!**



38 260 t CO<sub>2</sub>  
ha/g

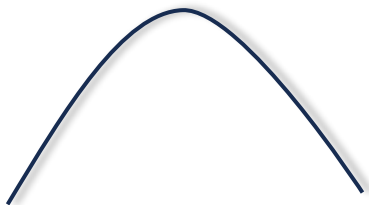


1 350 000 CO<sub>2</sub> ekv  
2021.g.



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He, H. et al, in preparation



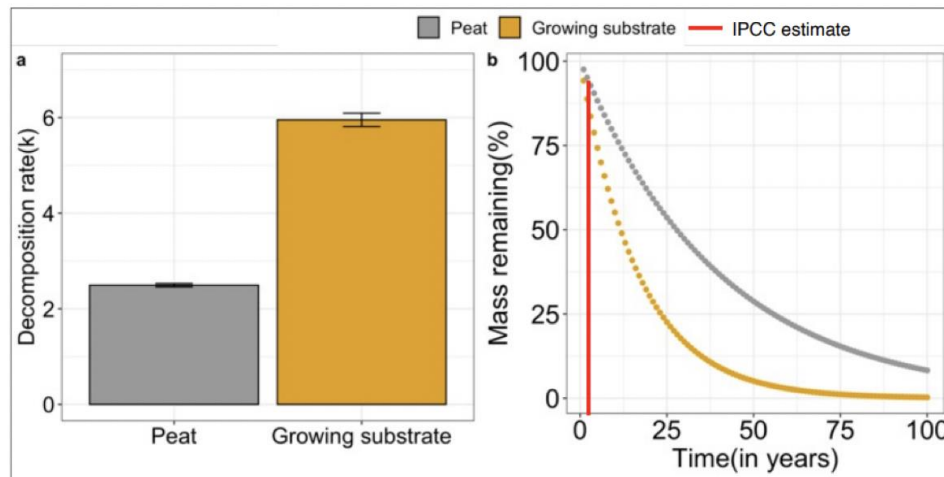
1,3 milj.t CO<sub>2</sub> ekv  
2021.g.

Igaunijas zinātnieku  
sākotnējie aprēķini -  
kūdra sadalās 1% gadā.

1,3 milj t CO<sub>2</sub> ekv  
sasniegtu 100 gados,  
jeb 2123.g.



## Decomposition rate



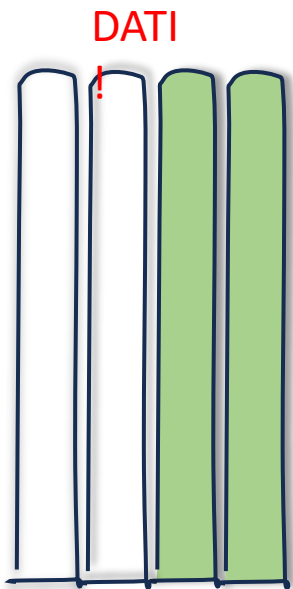
Kanādas zinātnieki aprēķinājuši, ka kūdra  
sadalās 100 gados, nevis 1 gadā, kā  
pieņemts IPCC vadlīnijās.

## Lielākie kūdras produktu eksportētāji

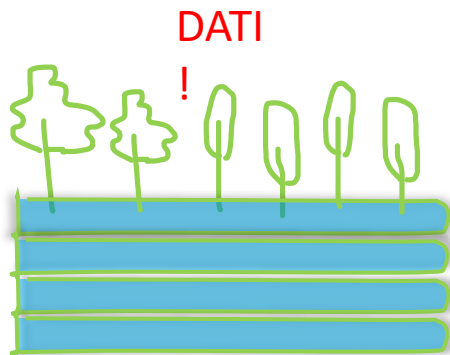
Valsts	2019. g. tūkst. t	2020. g. tūkst. t	2021. g. tūkst. t	2022. g. tūkst. t	Īpatsv. % glob. eksp. 2022. g.
Pasaule	<b>9253.0</b>	<b>11074.8</b>	<b>11707.4</b>	<b>10582.5</b>	<b>100.0</b>
<b>Latvija</b>	<b>1707.9</b>	<b>1977.1</b>	<b>2235.5</b>	<b>2110.7</b>	<b>19.9</b>
Kanāda	<b>1189.6</b>	<b>1420.1</b>	<b>1646.8</b>	<b>1428.1</b>	<b>13.5</b>
Vācija	<b>1436.6</b>	<b>1615.2</b>	<b>1726.4</b>	<b>1380.8</b>	<b>13.0</b>
Igaunija	<b>1078.8</b>	<b>1322.5</b>	<b>1367.3</b>	<b>1371.8</b>	<b>13.0</b>
Lietuva	<b>865.5</b>	<b>893.2</b>	<b>960.9</b>	<b>931.4</b>	<b>8.8</b>
Nīderlande	<b>668.6</b>	<b>1247.8</b>	<b>1329.1</b>	<b>911.0</b>	<b>8.6</b>
Beļģija	<b>285.7</b>	<b>344.3</b>	<b>422.9</b>	<b>397.9</b>	<b>3.8</b>
Somija	n/d	<b>95.1</b>	<b>325.5</b>	<b>391.6</b>	<b>3.7</b>
Īrija	<b>791.4</b>	<b>919.4</b>	<b>571.4</b>	<b>390.4</b>	<b>3.7</b>
Baltkrievija	<b>249.9</b>	<b>218.5</b>	<b>0.0</b>	<b>307.1</b>	<b>2.9</b>
Zviedrija	<b>239.4</b>	<b>271.5</b>	<b>340.1</b>	<b>294.4</b>	<b>2.8</b>

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# Kā sasniegt klimatneitritāti?



samazināt atsegtu lauku daudzumu



rekultivēt  
+ jau rekultivētās platības rēķināt kā piesaistes



pārstrādāt Latvijā



atkārtoti izmantot/kompostēt

	<b>2017</b> (Mm <sup>3</sup> y <sup>-1</sup> )	<b>2050</b> (Mm <sup>3</sup> y <sup>-1</sup> )	<b>Increase</b> %
Peat	40	80	200%
Coir	11	46	418%
Wood fibre	3	30	1000%
Bark	2	10	500%
Compost	1	5	500%
Perlite	1.5	10	667%
Stone wool	0.9	4	433%
Soils / tuffs	8	33	413%
New		65	
<b>Total</b>	<b>67</b>	<b>283</b>	

<https://edepot.wur.nl/546164>



